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TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

May 21, 2012

TO: Internal File

THRU: Steve Christensen, Permit Supervisor *SC*

FROM: April A. Abate, Environmental Scientist III *COCCO 5/22/2012*

RE: Northwater Mitigation Plan, Task ID #4079, Canyon Fuel Company, LLC, SUFCO Mine, C0410002

SUMMARY:

Canyon Fuel Company, LLC, has made several attempts to replace water that has been lost in the North Water Spring area located in the Pines Lease section of the SUFCO permit boundary. Pines 105, 310, 311, and Joes Mill Pond have undergone a loss of water and subsequent riparian habitat as a result of underground longwall mining activities that occurred in 2005. Subsidence resulted from mining and caused cracking in the Castlegate sandstone that represents the overburden bedrock. These cracks have subsequently caused select springs in the area to go dry. The United States Forest Service (USFS), the surface landowner, issues grazing permits to the Emery County Stockgrowers Association within the North Water Area.

On April 6, 2012 SUFCO submitted a proposal to install a submersible solar pump in the perennial flowing portion of the East Fork of Box Canyon that would deliver water via an aboveground pipeline to a total of four approximate 750-gallon water troughs used to water cattle. As part of this project, SUFCO has committed to providing an in-stream solar pump and panels, a water line to supply water to all four troughs and to providing water to troughs at the rim of the canyon above PINES 105, Joe's Mill Pond, and Trough 3 (elevation 8560'). The plan was intended to work in conjunction with a submersible pump supplied by the Emery Stockgrowers Association, the grazing Permittee in the area. This mitigation plan was presented to the Division, the USFS, the Division of Water Rights (DWRi) and the Emery County Stock Growers Association in November of 2011. SUFCO addressed the long term operation and maintenance of such a system stating that the company would provide a new in-stream solar pump and panels to the grazing permittee at the cessation of mining operations and ensure the troughs and pipeline were in good working order. All parties at the time were in general agreement that the proposed solution was an acceptable alternative with the final plan being subject to review and comment by the Forest Service and the Division upon submittal.

The following deficiencies address the hydrologic aspects of this plan submittal.

Findings:

R645-301.731.750

- **Operational Plan:** The installation a solar pump and associated panels meets the objectives of a current solution to the satisfaction of the Forest Service and DOGM. Both agencies acknowledge that this plan should be tested and cannot be considered a final solution until it can establish a proven operation and maintenance track record. As such, a bi-weekly monitoring schedule for the system should be set up during the grazing season. The Operator should add a commitment to Appendix 7-25 to include a statement that the system will be monitored on a bi-weekly basis and during its first season of operation, provide monthly updates (via e-mail) to DOGM and the USFS. Operation and maintenance information of the Northwater Mitigation system should also be included as an annual report item during the grazing seasons when it is in use. The information should include pump volume estimates and water volume supplied to each trough.
- Please include all piezometer data collected to date be included in Appendix 7-25 along with maps showing the locations of all piezometers. The Operator should add a commitment to Appendix 7-25 that piezometer data will be provided to the Division in the annual report. The piezometers will need to be included in the bonding calculations and addressed in the reclamation plan addressing their removal.

- The Operator should add a commitment to Appendix 7-25 stating that any water rights associated with the operational system will be transferred over to the USFS (or current water right holder). This transfer should take place approximately 3 years before the cessation of mining activities.

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TECHNICAL ANALYSIS:

EMERY MEETING – NOVEMBER 2011

At this meeting representatives from the Division, the Stock Growers Association, the USFS and the DWRi were present to observe the proposal presented by the SUFCO mine to address the water replacement of the springs lost in PINES tract. In general the stockgrowers, were pleased with the additional troughs and the improvements that SUFCO was proposing to make to the area.

The Division requested that SUFCO submit the plan in the form of an amendment to the MRP. The USFS, who currently own the land and the majority of water rights in the region, requested to review the plan and comment on it and expressed concern for the loss of riparian habitat.

OPERATION PLAN

The plan was submitted to the Division as an amendment on April 6, 2012 as Appendix 7-25 - the Northwater Mitigation Plan. The Division solicited comments from the Forest Service on the proposed mitigation plan. On May 18, 2012, the Manti La Sal National Forest submitted a comment letter to the Division. In summary, the USFS is supportive of the current operational plan, but with some reservations that this should not be considered the final resolution to the loss of water at Northwater Springs. The USFS advocated for a bi-weekly evaluation of monitoring the water supply to the system to assure that the system is functioning as designed. The USFS has also stated that the riparian area at North Water Springs has been impacted from the loss of water. The USFS has suggested that in order to mitigate for the loss of riparian habitat in the North Water Spring area, that an alternative riparian enhancement program be submitted somewhere in the Quitchupah or Muddy Creek drainages within the next 5 years. Lastly, the proposal of a new solar pump, panels and piping as a final solution to end SUFCO's responsibilities at the cessation of mining was not acceptable to the USFS. An alternative source of funding through a long-term bonding mechanism to supplement the replacement of the equipment was requested.

Water Rights

The surface water rights located at the point of diversion within the perennial portion of the East Fork of Box Canyon where the pump will be located is currently being covered by SUFCO water rights (t36672 and t37335). At the end of mine life, this water right will need to be transferred back to the Forest Service as the current landowner of record. This transfer should

take place at approximately 3 years prior to cessation of mining activities. No comment was received from the USFS on this point.

Previous Well Drilling and Slug Testing of the Castle Gate Sandstone

The Permittee submitted Attachment A to Appendix 7-25 which detailed the groundwater investigation that took place in the summer of 2009 as a possible alternative to a water replacement solution for the North Water area. Several hydrologic evaluations have been conducted since the undermining of the Northwater area occurred in 2006. Attachment A presents a drilling program that was conducted in the summer of 2009 to evaluate the potential amount of groundwater yield from the Castlegate Sandstone that underlies the North Water Canyon and Joes Mill areas.

In this drilling program, a total of four wells were installed at the base of the Castlegate and the uppermost Blackhawk formation. The wells were slug tested to determine if the groundwater hydraulic conductivity was significant enough to produce a sustainable water supply needed for water replacement. The results indicated that none of the wells met the criteria for a valid slug test and all results presented were for general purposes and should be viewed in light of the limitations of the slug test data. The April 2010 Petersen Hydrologic Report summarizing the well drilling and slug testing activities concluded that only a limited supply could be reached from the four wells drilled. However, the report did not rule out that a greater potential for groundwater production could come from wells developed in the sandy strata where known subsidence has occurred in the Uppermost Blackhawk formation if the sandstone strata directly underlying Castlegate sandstone is appreciably fractured.

Piezometer Data Collection

The Operator has previously installed a network of piezometers in Northwater Canyon and in the Joe's Mill Pond Area once it was discovered that subsidence cracks in the Castlegate sandstone had caused Springs 105, 310 and 311 to go dry. The purpose of the piezometers is to monitor the groundwater levels in both areas. SUFCO has continued to collect data from these piezometers but has never submitted any formal data and location data to the Division.

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- The Operator should add a commitment to Appendix 7-25 stating that any water rights associated with the operational system will be transferred over to the USFS (or current water right holder). This transfer should take place approximately 3 years before the cessation of mining activities.

RECOMMENDATIONS:

The plan cannot be approved until the above-listed deficiencies are addressed.